Claims

[c1] 1. A radiation imaging system comprising:
a movable radiation source configured to be displaced in a plurality of respective radiation source positions;
a radiation detector;
a collimator assembly, said assembly comprising a collimator, said assembly further being configured to displace the collimator in a plurality of respective collimator positions, each of said collimator positions being coordinated with at least one of said radiation source positions such that a radiation beam emanating from said radiation source is collimated to limit radiation incident on said detector to a predetermined exposure area.

[c2] 2. The imaging system of Claim 1 wherein said collimator assembly further comprises a collimator positioning apparatus for displacing said collimator in respective ones of said collimator positions, each of said collimator positions corresponding to a respective spatial relationship with said radiation source and said detector.

[c3] 3. The imaging system of Claim 2 wherein said collimator positioning apparatus further comprises a displacement mechanism comprising: a rotational displacement mechanism adapted to position the collimator axially with respect to the radiation source and the detector.

[c4] 4. The imaging system of Claim 2 wherein said collimator positioning apparatus further comprises a translational displacement mechanism adapted to position the collimator horizontally with respect to the radiation source and the detector.

[c5] 5. The imaging system of Claim 2 wherein said collimator positioning apparatus further comprises a multi-axis displacement mechanism adapted to position the collimator both axially and horizontally with respect to the radiation source and the detector.

[c6] 6. The imaging system of Claim 1, wherein each one of said collimator positions corresponds to exactly one of said radiation source positions.

[c7] 7. The imaging system of Claim 1, wherein said collimator further comprises an aperture assembly, said aperture assembly being configured to provide an adjustable geometry aperture.

[c8] 8. The imaging system of Claim 1, wherein said collimator further comprises an aperture assembly comprising radiation absorbing material and adapted to provide an adjustable geometry aperture to limit radiation incident on said detector to said predetermined exposure area.

[c9] 9. The imaging system of Claim 7, wherein said aperture assembly comprises a plurality of movable sides.

[c10] 10. The imaging system of Claim 7, wherein said aperture assembly comprises at least one movable side.

[c11] 11. The imaging system of Claim 7, wherein said aperture assembly comprises multiple independently positionable sections with different boundary shapes.

[c12] 12. The imaging system of Claim 11, wherein said multiple sections have linear boundaries.

[c13] 13. The imaging system of Claim 10, wherein said plurality of sides comprise rotationally and translationally movable sides.

[c14] 14. The imaging system of Claim 1, wherein said collimator further comprises an aperture of fixed geometry.

[c15] 15. The imaging system of Claim 14, wherein said fixed geometry aperture has a rectangular cross-section.

[c16] 16. The imaging system of Claim 15, wherein movement of said radiation source relative to said detector is the same as the movement of said radiation source relative to said aperture.
detecting the radiation beam on a radiation detector.

[c17] 17. A method for radiation imaging, comprising:

positioning a radiation source in a plurality of respective radiation source positions;

displacing a collimator in a plurality of respective collimator positions, each of said collimator positions corresponding to a respective one of said radiation source positions such that a radiation beam emanating from said radiation source is collimated to limit the incident radiation to a predetermined exposure area; and

[c18] 18. The method of Claim 17, wherein displacing said collimator comprises: displacing said collimator such that each of said collimator positions corresponds to a respective spatial relationship with said radiation source and said radiation detector.

[c19] 19. The method of Claim 18, wherein displacing said collimator comprises positioning the collimator axially with respect to the radiation source and the detector.

[c20] 20. The method of Claim 18, wherein displacing said collimator comprises positioning the collimator horizontally with respect to the radiation source and the detector.

[c21] 21. The method of Claim 18, wherein displacing said collimator comprises positioning the collimator both axially and horizontally with respect to the radiation source and the detector.

[c22] 22. The method of Claim 17, wherein displacing said collimator in said plurality of collimator positions is done such that each one of said collimator positions corresponds to exactly one of said radiation source positions.

[c23] 23. The method of Claim 17, wherein displacing said collimator further comprises adjusting the geometry of an aperture.

[c24] 24. The method of Claim 23, wherein adjusting the geometry of the aperture comprises moving a plurality of sides of an aperture assembly of said collimator.

[c25] 25. The method of Claim 23, wherein adjusting the geometry of the aperture comprises moving of at least one side of an aperture assembly of said collimator.

[c26] 26. The method of Claim 17, wherein displacing said collimator further comprises adjusting the geometry of an aperture for limiting radiation incident on said detector to said predetermined exposure area.

[c27] 27. The method of Claim 21, wherein the collimator comprises an aperture, and wherein positioning the radiation source and displacing the collimator are performed to provide movement of said radiation source relative to said detector that is the same as movement of said radiation source relative to said aperture.

[c28] 28. A radiation imaging system comprising:
a movable radiation source adapted to be disposed in a plurality of respective radiation source positions;
a radiation detector;
a collimator assembly, said assembly comprising a collimator comprising an aperture assembly configured to provide an aperture and a collimator positioning apparatus for displacing said collimator in a plurality of respective collimator positions, each of said collimator positions being coordinated with at least one of said radiation source positions such that a radiation beam emanating from said radiation source is collimated through the aperture to limit radiation incident on said detector to a predetermined exposure area.

[c29] 29. The imaging system of Claim 28, wherein each of said collimator positions corresponds to a respective spatial relationship with said radiation source and said radiation detector.

[c30] 30. The imaging system of Claim 28, wherein each one of said collimator positions corresponds to exactly one of said radiation source positions.

[c31] 31. The imaging system of Claim 28, wherein said aperture assembly is configured to provide an adjustable geometry aperture.

[c32] 32. The imaging system of Claim 31, wherein said aperture assembly comprises a plurality of movable sides.

[c33] 33. The imaging system of Claim 31, wherein said aperture assembly comprises at least one movable side.

[c34] 34. The imaging system of Claim 28, wherein said aperture assembly is configured to provide an aperture of fixed geometry.

[c35] 35. The imaging system of Claim 34, wherein the aperture of fixed geometry has a rectangular cross-section.

[c36] 36. A radiation imaging system comprising :
a movable radiation source;
a radiation detector;
a collimator comprising an adjustable geometry aperture assembly configured such that an adjustment of the aperture geometry is synchronized with the movement of said radiation source and coordinated with the radiation source position so as to limit the incident radiation to a predetermined exposure area at said detector.

[c37] 37. The imaging system of Claim 36, wherein said aperture assembly is configured for adjusting at least one of the position of the aperture and the shape of the aperture.

[c38] 38. The imaging system of Claim 36, further comprising a collimator assembly comprising
a collimator positioning apparatus for positioning said collimator.

[c39] 39. The imaging system of Claim 36, wherein said aperture assembly comprises a plurality of movable sides.

[c40] 40. The imaging system of Claim 36, wherein said aperture assembly comprises at least one movable side.

[c41] 41. The imaging system of Claim 36, wherein said aperture assembly comprises multiple independently positionable sections with different boundary shapes.

[c42] 42. The imaging system of Claim 41, wherein said multiple sections have linear boundaries.

[c43] 43. The imaging system of Claim 39, wherein said plurality of sides comprise rotationally and translationally movable sides.

[c44] 44. A method for radiation imaging, comprising:
moving a radiation source in a plurality of radiation source positions;
adjusting an aperture by synchronizing the aperture geometry adjustment with the movement of said radiation source and coordinating at least one of the position and the shape of said aperture with the respective position of said radiation source such that a radiation beam emanating from said radiation source is collimated to limit the incident radiation to a predetermined exposure area; and
detecting the radiation beam on a radiation detector.